

BIBLIOGRAPHY ON CARBOHYDRATE POLYMERS

2 Cellulose

About-Enein HY, Islam MR//King Faisal Specialist Hosp & Res Ctr, Radionuclide & Cyclotron Operat, Drug Dev Lab, POB 3354, Riyadh 11211, Saudi Arabia

J CHROMATOGR 1990, 511 (JUL) 109

Direct separation and optimization of timolol enantiomers on a cellulose tris-3,5-dimethylphenyl-carbamate high-performance liquid chromatographic chiral stationary phase

Belova EM, Vais NG, Sopin VF, Kazakov AI, Rubtsov YI, Manelis GB, Marchenko GN//NN Semenov Chem Phys Inst, Moscow, USSR
BULL ACAD SCI USSR D CHEM SCI 1989, 38 (11) PT1, 2244

Kinetics and mechanism of nitration of cellulose with the $\text{HNO}_3\text{-CH}_2\text{Cl}_2$ mixture

Bryk MT, Nigmatullin RR, Atamanenko ID, Gomza YP, Shilov VV//Acad Sci UkSSR, Inst Colloid Chem & Water Chem, Kiev, Ukraine, USSR

VYSOKOMOL SOEDIN SER A SSSR 1990, 32 (7) 1473

Porous structure of ultrafiltrational cellulose acetate membranes of various degrees of saponification

Buchanan CM, Hyatt SS*, Kelley SS, Little JL//Eastman Chem Co, Res Labs, POB 1972, Kingsport, Tn 37662, USA
MACROMOLECULES 1990, 23 (16) 3747

Alpha-D-celooligosaccharide acetates - Physical and spectroscopic characterization and evaluation as models for cellulose triacetate

Carlsson A, Karlstrom G, Lindman B//Univ Lund, Ctr Chem, POB 124, S-22100 Lund, Sweden

COLLOID SURFACE 1990, 47 (JUL) 147

Thermal gelation of nonionic cellulose ethers and ionic surfactants in water

Corkhill PH, Tighe BJ//Univ Aston, Dept Chem Engrg & Appl Chem, Special Met Res Grp, Aston Triangle, Birmingham B4 7ET, England
POLYMER 1990, 31 (8) 1526

Synthetic hydrogels. 7. High EWC semi-interpenetrating polymer networks based on cellulose esters and N-containing hydrophilic monomers

Echizen H, Ochiai K, Kato Y, Chiba K, Ishizaki T//Natl Med Ctr, Clin Res Inst, Div Clin Pharmacol, Toyama 1-21-2, Shinjuku ku, Tokyo 162, Japan

CLIN CHEM 1990, 36 (7) 1300

Simultaneous determination of disopyramide and mono-N-dealkyldisopyramide enantiomers in plasma and urine by use of a chiral cellulose-derivative column

Fernandez MJ, Casinos I*, Guzman GM//Univ Pais Vasco, Fac Quim, Dept Ciencia & Tecnol Polimeros, Apdo 1072, E-20080 San Sebastian, Spain

J POLYM SCI A-POLYM CHEM 1990, 28 (9) 2275

Effect of the way of addition of the reactants in the graft copolymerization of a vinyl acetate-methyl acrylate mixture onto cellulose

Fernandez MJ, Casinos I*, Guzman GM//Univ Pais Vasco, Fac Quim, Dept Ciencia & Tecnol Polimeros, Apdo 1072, E-20080 San Sebastian, Spain

J POLYM SCI A-POLYM CHEM 1990, 28 (9) 2293

A method for the extraction of the unreacted cellulose from its graft copolymers

Kobayashi M, Suzawa I, Ichishima E//Natl Food Res Inst, Tsukuba 305, Japan

AGR BIOL CHEM TOKYO 1990, 54 (7) 1705

Highly reactive dialdehydes of cellulose and alpha-cyclodextrin

Komar VV, Ermolenko IN//Acad Sci BeSSR, Inst Gen & Inorgan Chem, Minsk, Belorussia,

As a service to subscribers, each issue of the Journal contains a bibliography of newly published material in the field of carbohydrate polymers. The bibliography is divided into ten sections: 1 Books, Reviews and Symposia; 2 Cellulose; 3 Cellulose-degrading Enzymes; 4 Cyclodextrins; 5 Lignin; 6 Polysaccharides - Named; 7 Polysaccharides - Other; 8 Lipopolysaccharides; 9 Starch; 10 Starch-degrading Enzymes. Within each section, articles are listed in alphabetical order with respect to the subject. When there are no publications to appear under one of these headings, that section will be omitted.

USSR

J APPL CHEM-ENGL TR 1989, 62 (10) PT2, 2141

Formation of images from copper on bismuth-containing cellulose textile materials

Lederer M//Univ Lausanne, Inst Chim Minerale & Analyt, Pl Chateau 3, CH-1005 Lausanne, Switzerland

J CHROMATOGR 1990, 510 (JUN) 367

Adsorption chromatography on cellulose. VI. Further studies on the separation of D- and L-tryptophan on cellulose with aqueous solvents

Maunoir S, Philip H, Rambaud A*, Philippi LS//Fac Pharm Montpellier, Dept Sci Environnement & Sante Publ, 15 Ave Charles Flehault, F-34060 Montpellier, France

ENVIRON TECHNOL 1990, 11 (7) 625

Stimulation of psychrophilic anaerobic digestion of cellulose in a septic tank by bioactivator (French, English Abstract)

McCormick CL, Dawsey TR//Univ So Mississippi, Dept Polymer Sci, Hattiesburg, Ms 39406, USA

MACROMOLECULES 1990, 23 (15) 3606

Preparation of cellulose derivatives via ring-opening reactions with cyclic reagents in lithium chloride N,N-dimethylacetamide

Miller L, Weyker C//GD Searle & Co, Dept Chem Dev, 4901 Searle Pkwy, Skokie, Il 60077, USA

J CHROMATOGR 1990, 511 (JUL) 97

Analytical and preparative resolution of enantiomers of prostaglandin precursors and prostaglandins by liquid chromatography on derivatized cellulose chiral stationary phases

Mislovicova D, Gemeiner P, Stratilova E, Horvathova M//Skovak Acad Sci, Inst Chem, Dubravska Cesta 9, CS-84238 Bratislava, Czechoslovakia

J CHROMATOGR 1990, 510 (JUN) 197

Competitive elution of lactate dehydrogenase from Cibacron blue-bead cellulose with Cibacron blue-dextrans

Reuter R, Naumann M, Kopperschlager G**//Karl Marx Univ, Fac Med, Inst Biochem, O-7010 Leipzig, FRG

J CHROMATOGR 1990, 510 (JUN) 189

New aspects of dye-ligand affinity chromatography of lactate dehydrogenase applying spacer-mediated beaded cellulose

Saunders CW, Taylor LT**//Virginia Polytech Inst & State Univ, Blacksburg, Va 24061, USA

APPL SPECTROSC 1990, 44 (6) 967

Solution infrared spectra of cellulose acetate butyrate

Sheveleva IV, Khabalov VV, Gulko NV//Acad Sci USSR, Inst Chem, Vladivostok 690022, USSR

UKR KHIM ZH 1990, 56 (6) 605

Electrochemical and sorptional properties of electrodes from unwoven carbon fibers based on hydrate cellulose (Russian)

Xiao CF, Liu ZF//Tianjin Text Engr Coll, Dept Text Chem, Tianjin, Peoples R China

J APPL POLYM SCI 1990, 41 (1-2) 439

Microvoid formation of acrylic copolymer (PAC) cellulose acetate (CA) blend fibers

Yoshino K, Matsuoka R, Nogami K, Yamanaka S, Watanabe K, Takahashi M, Honma M//Osaka Univ, Fac Engr, Suita, Osaka 565, Japan

J APPL PHYS 1990, 68 (4) 1720

Graphite film prepared by pyrolysis of bacterial cellulose

Lippold BC, Lippold BH, Sutter BK, Gunder W//Univ Dusseldorf, Inst Pharmazeut Technol, W-4000 Dusseldorf 1, FRG

DRUG DEVELOP IND PHARM 1990, 16 (11) 1725

Properties of aqueous, plasticizer-containing ethyl cellulose dispersions and prepared films in respect to the production of oral extended release formulations

Sugawa M, Suzuki K, Endo K, Kumemura M, Takeuchi M, Mitsuoka T//Nihon Shokuhin Kako Co Ltd, Res Inst, Tajima 30, Fuji, Shizuoka 417, Japan

AGR BIOL CHEM TOKYO 1990, 54 (7) 1683

Effect of the dietary supplementation of corn hemicellulose on fecal flora and bacterial enzyme activities in human adults

Nudga LA, Plisjo EA, Petropavlovskii GA//Acad Sci USSR, Inst Macromolec Cpds, Moscow V-71, USSR

J APPL CHEM-ENGL TR 1989, 62 (11) PT2, 2386

Graft polymerization of vinyl acetate to allyl hydroxyethyl cellulose in aqueous medium

Maeda M, Yamamoto Y, Baba Y, Kagemoto A*//Osaka Inst Technol, Dept Gen Educ, Chem Lab, Ashahi ku, Osaka 535, Japan
THERMOCHIM ACTA 1990, 163 (JUN) 155

Heats of dilution of water-soluble-polymer solutions. 2. Heat interaction parameters of aqueous hydroxypropylcellulose and gelatin solutions determined by means of flow microcalorimeter

McNally EJ, Zografi G*//Univ Wisconsin, Sch Pharm, Madison, WI 53706, USA

J COLLOID INTERFACE SCI 1990, 138 (1) 61
Spread and adsorbed monolayers of hydroxypropyl cellulose and hydroxyethyl cellulose at the air-water interface

Paine AJ//Xerox Res Ctr Canada Ltd, Mississauga, Ontario, Canada L5K 2L1

J POLYM SCI A-POLYM CHEM 1990, 28 (9) 2485

Dispersion polymerization of styrene in polar solvents. 4. Solvency control of particle size from hydroxypropyl cellulose stabilized polymerizations

Paine AJ//Xerox Res Ctr Canada Ltd, Mississauga, Ontario, Canada L5K 2L1

J COLLOID INTERFACE SCI 1990, 138 (1) 157

Dispersion polymerization of styrene in polar solvents. 1. Grafting mechanism of stabilization by hydroxypropyl cellulose

Suto S, Tashiro H, Karasawa M//Yamagata Univ, Fac Engn, Dept Polymer Chem, Jonan 4-3-16, Yonezawa, Yamagata 992, Japan

J MATER SCI LETT 1990, 9 (7) 768

Circular dichroism study of crosslinked cholesteric liquid crystalline hydroxypropyl cellulose solid films

Fernandez-Vigo J, Refojo MF*, Verstraeten T//Eye Res Inst, 20 Staniford St, Boston, MA 02114, USA

RETINA-J RETIN VITR DIS 1990, 10 (2) 148

Evaluation of a viscoelastic solution of hydroxypropyl methylcellulose as a potential vitreous substitute

Fernandez-Vigo J, Sabugal JF, Diaz Rey A, Concheiro A, Martinez R//C Gen Pardinas 9-7B, E-15701 Santiago, Spain

J OCUL PHARMACOL 1990, 6 (2) 137

Molecular weight dependence of the pharmacokinetic of hydroxypropyl methylcellulose in the

vitreous

3 Cellulose-degrading Enzymes

Liaw E-T, Penner MH*//Oregon State Univ, Dept Food Sci & Technol, Corvallis, OR 97331, USA

APPL ENVIRON MICROBIOL 1990, 56 (8) 2311

Substrate-velocity relationships for the *Trichoderma viride* cellulase-catalyzed hydrolysis of cellulose

Ma DB, Gao PJ, Wang ZN//Shandong Univ, Inst Microbiol, Jinan 250100, Peoples R China

ENZYME MICROB TECHNOL 1990, 12 (8) 631

Preliminary studies on the mechanism of cellulase formation by *Trichoderma pseudokoningii* S-38

Ooshima H, Burns DS, Converse AO//Osaka City Univ, Fac Engn, Dept Appl Chem, Osaka 558, Japan

BIOTECHNOL BIOENG 1990, 36 (5) 446

Adsorption of cellulase from *Trichoderma reesei* on cellulose and lignocellulosic residue in wood pretreated by dilute sulfuric acid with explosive decompression

Roy U, Roy PK, Vora VC//Cent Drug Res Inst, Div Biochem, Lucknow 226001, Uttar Pradesh, India

J MICROBIAL BIOTECHNOLOGY 1990, 5 (1) 32

Application of dye bound substrate cellulose azure for determination of *Macrophomina phaseolina* cellulase activity

Sharma VK, Hobson PN//Univ Manitoba, Div Environm Engn, Winnipeg, Manitoba, Canada R3T 2N2

BIOL WASTE 1990, 33 (2) 81

Isolation and characterization of a new *Sarcina*-like cellulolytic bacterium from an anaerobic, mesophilic, cattle-waste digester

Tomme P, Heriban V, Claeysens M*//State Univ Ghent, Biochem Lab, KL Ledeganckst 35, B-9000 Ghent, Belgium

BIOTECHNOL LETT 1990, 12 (7) 525

Adsorption of two cellobiohydrolases from *Trichoderma reesei* to Avicel: Evidence for 'exo-exo' synergism and possible 'loose complex' for-

mation

Yazdi MT, Woodward JR, Radford A*//Univ Tehran, Coll Pharm, Tehran, Iran
J GEN MICROBIOL 1990, 136 (JUL) PT 7, 1313

The cellulase complex of *Neurospora crassa*: Activity, stability and release

4 Cyclodextrins

Armstrong DW, Stalcup AM, Hilton ML, Duncan JD, Faulkner JR, Chang SC//Univ Missouri, Dept Chem, Rolla, Mo 65401, USA
ANAL CHEM 1990, 62 (15) 1610

Derivatized cyclodextrins for normal-phase liquid chromatographic separation of enantiomers

Baeyens WRG, Ling BL, Coebisier V, Raemdonck A//State Univ Ghent, Fac Pharmaceut Sci, Pharmaceut Chem & Drug Analy Lab, Harelbekestr 72, B-9000 Ghent, Belgium
ANAL CHIM ACTA 1990, 234 (1) 187

Enhanced fluorescence from ortho-phthalaldehyde and fluorescamine fluorophores using Triton and beta-cyclodextrin

Blum W, Aichholz R//Ciba Geigy AG, Zent Funkt Forsch, CH-4002 Basle, Switzerland
HRC-J HIGH RES CHROMATOGR 1990, 13 (7) 515

Gas chromatographic enantiomer separation on tert-butyldimethylsilylated beta-cyclodextrin diluted in PS-086 - A simple method to prepare enantioselective glass capillary columns

Floor M, Peters JA, van Bekkum H*, Kieboom APG, Koek JH, Smeets FLM, Niemantsverdriet RE//Delft Univ Technol, Organ Chem Lab, Julianalaan 136, 2628 BL Delft, The Netherlands
CARBOHYD RES 1990, 203 (1) 19

Structural and conformational effects on the complexation of calcium by 2,3-dicarboxy derivatives of beta-cyclodextrin (cyclomaltoheptaose), amylose, and cellulose

Hellman J, Wahlberg M, Karp M, Korpela T, Mantsala P//Univ Turku, Dept Biochem, SF-20500 Turku 50, Finland
BIOTECHNOL APPL BIOCHEM 1990, 12 (4) 387

Effects of modifications at the C-terminus of cyclomaltodextrin glucanotransferase from *Bacillus circulans* var *alkalophilus* on catalytic activity

Hu Y, Harada A, Takahashi S*//Osaka Univ, Inst Sci & Ind Res, Ibaraki, Osaka 567, Japan
J MOL CATAL 1990, 60 (3) L13

Inverse phase-transfer effect of cyclodextrins - Oxidation reaction of benzyl alcohols by NaCl aqueous solution

Jaime C, Redondo J, Sanchez-Ferrando F*, Virgili A//Univ Autonoma Barcelona, Dept Quim, E-08193 Barcelona, Spain
J ORG CHEM 1990, 55 (15) 4772

Solution geometry of beta-cyclodextrin-1-bromoadamantane host-guest complex as determined by $^1\text{H}\{^1\text{H}\}$ intermolecular NOE and MM2 calculations

Landau S, Grushka E*//Hebrew Univ Jerusalem, Dept Inorgan & Analyt Chem, IL-91904 Jerusalem, Israel
ISR J CHEM 1990, 30 (3) 271

High performance liquid chromatographic studies of some cyclodextrin complexes

Marquez JC, Hernandez M, Sanchez FG//Univ Malaga, Fac Sci, Dept Analyt Chem, E-29071 Malaga, Spain
ANALYST 1990, 115 (7) 1003

Enhanced spectrofluorimetric determination of the pesticide warfarin by means of the inclusion complex with beta-cyclodextrin

Merino IM, Gonzalez EB, Sanzmedel A*//Univ Oviedo, Fac Chem, Dept Phys & Analyt Chem, Julian Claveria S-N, E-33006 Oviedo, Spain
ANAL CHIM ACTA 1990, 234 (1) 127

Liquid chromatographic enantiomeric resolution of amino acids with beta-cyclodextrin bonded phases and derivatization with ortho-phthalaldehyde

Nakanishi N, Tsujikawa J, Hara N, Tanimoto T, Koizumi K*//Mukogawa Womens Univ, Fac Pharmaceut Sci, 11-68 Koshien Kyuban cho, Nishinomiya 663, Japan
YAKUGAKU ZASSHI-J PHARM SOC J 1990, 110 (7) 477

Synthesis of 6^A,6^X-di-O-(tert-butyldimethylsilyl)-alpha- and -beta-cyclodextrin derivatives (Japanese, English Abstract)

Niino H, Miyasaka H, Ouchi A, Kawabata Y, Yabe A, Nakahara H, Fukuda K, Miyasaka T, Tagaki W//Natl Chem Lab Ind, Tsukuba, Ibaraki 305, Japan
CHEM LETT 1990, (7) 1121

Reversible control of charge transfer interaction in the Langmuir-Blodgett film of an amphiphilic cyclodextrin

Okada Y, Tachibana M, Koizumi K*//Mukogawa Womens Univ, Fac Pharmaceut Sci, 11-68 Koshien Kuban cho, Nishinomiya 663, Japan
CHEM PHARM BULL TOKYO 1990, 38 (7) 2047

Solubilization of lipid-soluble vitamins by complexation with glucosyl-beta-cyclodextrin

Paleologou M, Li S, Purdy WC*//McGill Univ, Dept Chem, 801 Sherbrooke St W, Montreal, Quebec, Canada H3A 2K6
CAN J CHEM 1990, 68 (7) 1208

Liquid chromatographic retention behaviour and separation of chlorophenols on a beta-cyclodextrin bonded-phase column. 3. Diaromatic chlorophenols

Rong D, D'Souza VT*//Univ Missouri, Dept Chem, St Louis, Mo 63121, USA
TETRAHEDRON LETT 1990, 31 (30) 4275

A convenient method for functionalization of the 2-position of cyclodextrins

Schurig V, Jung M, Schmalzing D, Schleimer M, Duvekot J, Buyten JC, Peene JA, Mussche P//Univ Tübingen, Inst Organ Chem, Auf Morgenstelle 18, W-7400 Tübingen 1, FRG
HRC-J HIGH RES CHROMATOGR 1990, 13 (7) 470

CGC enantiomer separation on diluted cyclodextrin derivatives coated on fused silica columns

Steiner T, Mason SA, Saenger W*//Free Univ Berlin, Inst Kristallog, Takustr 6, W-1000 Berlin 33, FRG

J AMER CHEM SOC 1990, 112 (17) 6184

Cooperative O-H...O hydrogen bonds in beta-cyclodextrin-ethanol-octahydrate at 15 K: A neutron diffraction study

Wernick DL, Yazbek A, Levy J//TIRZA, POB 443, IL-44814 D N Efraim, Israel
J CHEM SOC CHEM COMMUN 1990, (14) 956

Ternary complexes and Diels-Alder reaction of cyclopentadiene in crystalline cyclodextrins

5 Lignin

Funaoka M, Kako T, Abe I//Mie Univ, Fac Bioresources, Isis Kamihama, Tsu, Mie 514,

Japan

WOOD SCI TECHNOL 1990, 24 (3) 277

Condensation of lignin during heating of wood

Reimann A, Morck R, Yoshida H, Hatakeyama H, Kringstad KP//STFI, Box 5604, S-11486 Stockholm, Sweden

J APPL POLYM SCI 1990, 41 (1-2) 39

Kraft lignin in polyurethanes. 3. Effects of the molecular weight of PEG on the properties of polyurethanes from a Kraft lignin PEG MDI system

Silva H, Landa A, Agosin E//Univ Chile, Inst Nutr & Tecnol Alimentos, Biotechnol Lab, Casilla 13811, Santiago, Chile

ARCH BIOL MED EXP 1990, 23 (1) 41

Isolation, selection and characterization of Chilean ligninolytic fungi (Spanish, English Abstract)

Singh R, Srivastava SK//Indian Vet Res Inst, Div Anim Nutr, Izatnagar 243122, Uttar Pradesh, India

J MICROBIAL BIOTECHNOLOGY 1990, 5 (1) 1

Degradation of cell wall components and changes in digestibility of wheat straw fermented with lignolytic fungi

6 Polysaccharides - Named

Yokoyama F, Achife EC, Momoda J, Shimamura K, Monobe K//Okayama Univ, Fac Engr, Dept Appl Chem, Okayama 700, Japan

COLLOID POLYM SCI 1990, 268 (6) 552

Morphology of optically anisotropic agarose hydrogel prepared by directional freezing

Galazzo JL, Bailey JE*//Caltech, Dept Chem Engr, Pasadena, Ca 91125, USA

BIOTECHNOL BIOENG 1990, 36 (4) 417

Growing *Saccharomyces cerevisiae* in calcium-alginate beads induces cell alterations which accelerate glucose conversion to ethanol

Gilson CD, Thomas A, Hawkes FR//Polytech Wales, Dept Sci & Chem Engr, Pontypridd CF37 1DL, Wales

PROCESS BIOCHEM 1990, 25 (3) 104

Gelling mechanism of alginate beads with and without immobilised yeast

Matsumoto T, Mashiko K*//Japan Tobacco Inc,

Engn Res Inst, 1-31 Kurobeoka, Hiratsuka, Kanagawa 254, Japan

BIOPOLYMERS 1990, 29 (14) 1707

Viscoelastic properties of alginate aqueous solutions in the presence of salts

Tari MG, Mancino M, Pozzuoli G, Mauro B, Verga A, Monti G//Unita Operat Allergol Arienzo, Caserta, Cas Post 22, I-81021 Arienzo, Italy

ALLERGOL IMMUNOPATHOL 1990, 18 (1) 35

Immunotherapy with alginate-conjugated two grass pollen extract in patients with allergic rhinoconjunctivitis

Gruber PR, Gray GR*//Univ Minnesota, Dept Chem, Minneapolis, Mn 55455, USA

CARBOHYD RES 1990, 203 (1) 79

Isolation and analysis by the reductive-cleavage method of linkage positions and ring forms in the Mycobacterium smegmatis cell-wall arabinogalactan

Nadison J//Address not available

DAIRY IND INT 1990, 55 (7) 12

The interaction of carrageenan and starch in cream desserts

Bai ZP, Nakamura T, Izutsu K//Shinshu Univ, Fac Engn, Dept Chem, Matsumoto, Nagano 390, Japan

ANAL SCI 1990, 6 (3) 443

Voltammetric behavior of various anions at a chitin-containing carbon paste electrode

Tanner SF, Chanzy H, Vincendon M, Roux JC, Gaill F//AFRC, Inst Food Res, Norwich Lab, Norwich NR4 7UA, Norfolk, England

MACROMOLECULES 1990, 23 (15) 3576

High-resolution solid-state carbon-13 nuclear magnetic resonance study of chitin

Agerkvist I, Eriksson L, Enfors S-O//Inst Surface Chem, Box 5607, S-11486 Stockholm, Sweden

ENZYME MICROB TECHNOL 1990, 12 (8) 584

Selective flocculation with chitosan in Escherichia coli disintegrates: Effects of pH and nuclease treatment

Takayama K, Hirata M, Machida Y, Masada T, Sannan T, Nagai T//Hoshi Univ, Dept Pharma-

ceut, Ebara 2-4-41, Shinagawa ku, Tokyo 142, Japan

CHEM PHARM BULL TOKYO 1990, 38 (7) 1993

Effect of interpolymer complex formation on bioadhesive property and drug release phenomenon of compressed tablet consisting of chitosan and sodium hyaluronate

Usui T, Matsui H, Isobe K//Shizuoka Univ, Fac Agr Chem, Ohya 836, Oya, Shizuoka 422, Japan

CARBOHYD RES 1990, 203 (1) 65

Enzymic synthesis of useful chito-oligosaccharides utilizing transglycosylation by chitinolytic enzymes in a buffer containing ammonium sulfate

Yu YS, Li WJ, Yu TY//Fudan Univ, Dept mat Sci, Shanghai 200433, Peoples R China

POLYM COMM 1990, 31 (8) 319

Crosslinking chitosan membranes for pervaporation of alcohol-water mixtures

Fransson L-A, Havsmark B, Silverberg I//Univ Lund, Dept Physiol Chem, POB 94, S-22100 Lund, Sweden

BIOCHEM J 1990, 269 (2) 381

A method for the sequence analysis of dermatan sulphate

El-Sayed AHMM, Mahmoud WM, Coughlin RW*//Univ Connecticut, Dept Chem Engn, Storrs, Ct 06268, USA

BIOTECHNOL BIOENG 1990, 36 (4) 338

Production of dextranucrase by Leuconostoc mesenteroides immobilized in calcium-alginate beads: I. Batch and fed-batch fermentations

El-Sayed AHMM, Mahmoud WM, Coughlin RW*//Univ Connecticut, Dept Chem Engn, Storrs, Ct 06268, USA

BIOTECHNOL BIOENG 1990, 36 (4) 346

Production of dextranucrase by Leuconostoc mesenteroides immobilized in calcium-alginate beads: II. Semicontinuous fed-batch fermentations

Hartman NR, Johns DG, Mitsuya H*//NCI, Clin Oncol Program, Bldg 10, Room 13N248, Bethesda, Md 20892, USA

AIDS RES HUM RETROVIRUS 1990, 6 (6) 805

Pharmacokinetic analysis of dextran sulfate in rats as pertains to its clinical usefulness for therapy of HIV infection

Kobs SF, Husman DW, Cawthern KM, Mayer RM//Ohio State Univ, Dept Chem, Columbus, Oh 43210, USA

CARBOHYD RES 1990, 203 (1) 156

Affinity purification of dextranucrase from *Streptococcus sanguis* ATCC 10558

Luscher-Mattli M, Gluck R//Univ Bern, Inst Biochem, Freiestr 3, CH-3012 Bern, Switzerland
ANTIVIR RES 1990, 14 (1) 39

Dextran sulfate inhibits the fusion of influenza virus with model membranes, and suppresses influenza virus replication in vivo

Mabeau S, Kloareg B, Joseleau J-P//CNRS, Ctr Etud Oceanol & Biol Marine, LP 4601, F-29211 Roscoff, France

PHYTOCHEMISTRY 1990, 29 (8) 2441

Fractionation and analysis of fucans from brown algae

Bezukladnikov PW, Elyakova LA//Acad Sci USSR, Pacific Inst Bioorgan Chem, Vladivostok 690022, USSR

CARBOHYD RES 1990, 203 (1) 119

Transglycosylation and multiple attack of endo-(1-3)-beta-D-glucanase L-IV from *Spizula sachalinensis*: A new approach to the evaluation of the degree of multiple attack on polysaccharides

Kitamura S, Ozasa M, Tokooka H, Hara C, Ukai S, Kuge T//Kyoto Prefectural Univ, Dept Agr Chem, Kyoto 606, Japan

THERMOCHIM ACTA 1990, 163 (JUN) 89

A differential scanning calorimetric study of the conformational transitions of several kinds of (1-6) branched (1-3)-beta-D-glucans in a mixture of water and dimethylsulfoxide

Kobayashi M, Urayama T, Ichishima E//Natl Food Res Inst, Tsukuba 305, Japan

AGR BIOL CHEM TOKYO 1990, 54 (7) 1711

Fluorescent derivatives of polysaccharide dialdehyde as substrates for glucanases

Llauberes R-M, Richard B, Lonvaud A, Dubourdieu D, Fournet B*//Univ Lille 1, Chim Biol Lab, F-59655 Villeneuve Dascq, France

CARBOHYD RES 1990, 203 (1) 103

Structure of an exocellular beta-D-glucan from *Pediococcus* sp, a wine lactic bacteria

Saito H, Yoshioka Y, Yokoi M, Yamada J//Natl Canc Ctr, Res Inst, Div Biophys, Tsukiji 5

chome, Chuo ku, Tokyo 104, Japan

BIOPOLYMERS 1990, 29 (14) 1689

Distinct gelation mechanism between linear and branched (1-3)-beta-D-glucans as revealed by high-resolution solid-state ¹³C NMR

Kobayashi K, Ichikawa H, Sumitomo H//Nagoya Univ, Fac Agr, Chikusa ku, Nagoya, Aichi 464, Japan

MACROMOLECULES 1990, 23 (15) 3708

Regioselectively modified stereoregular polysaccharides. 11. Synthesis of (1-6)-alpha-D-glucopyranans having one long hydrocarbon chain in position 3 in each repeating unit

Lafont D, Boullanger P, Banoub J, Descotes G//Univ Lyon 1, Ecole Super Chim Ind Lyon, CNRS, UA 463, Chim Organ Lab 2, F-69622 Villeurbanne, France

CAN J CHEM 1990, 68 (6) 828

Synthesis of glycan fragments of glycoproteins using peracetylated N-allyloxycarbonyl-beta-D-glucosamine and 1,6-anhydro-beta-D-mannopyranose derivatives

Charlson AJ, Stephen AM, Ravenscroft N//Macquarie Univ, Sch Chem, N Ryde, NSW 2109, Australia

CAN J CHEM 1990, 68 (7) 1004

The acetolysis of reduced *Acacia saligna* (syn *cyanophylla*) gum exudate

Eisenberg PR//Washington Univ, Sch Med, Div Cardiovasc, St Louis, Mo 63110, USA

CORONARY ARTERY DIS 1990, 1 (2) 159

Mechanism of action of heparin and anticoagulant therapy: Implications for the prevention of arterial thrombosis and the treatment of mural thrombosis

Kudryashov BA, Lyapina LA, Azieva LD//MV Lomonosov State Univ, Fac Biol, Blood Coagulat Lab, Moscow 117234, USSR

VOP MED KHIM SSSR 1990, 36 (4) 55

Complex formation of heparin and histamine - Its physico-chemical and biological properties (German, English Abstract)

Riesenfeld J, Roden L*//Univ Alabama, Dept Med, POB 500, Birmingham, Al 35294, USA

ANAL BIOCHEM 1990, 188 (2) 383

Quantitative analysis of N-sulfated, N-acetylated, and unsubstituted glucosamine amino groups in heparin and related polysaccharides

- Stuttgen G, Bauer E//Kissingenstr 12, W-1000 Berlin 33, FRG
 ACTA THERAP 1990, 16 (3) 265
 The permeation of heparin through human skin
- Toulemonde F//Inst Choay Sanofi, 46 Ave Theophile Gautier, F-75782 Paris 16, France
 ACTA THERAP 1990, 16 (3) 197
 Strategy behind the development of the first ultra low molecular weight heparin fragment (CY 222) for the treatment of thromboembolic diseases
- Fedarko NS, Termine JD, Robey PG//NIDR, Bethesda, Md 20892, USA
 ANAL BIOCHEM 1990, 188 (2) 398
 High-performance liquid chromatographic separation of hyaluronan and four proteoglycans produced by human bone cell cultures
- Erman A, van Dyk DJ, Pansky R, Wittenberg C, Boner G, Rosenfeld JB//Beilinson Med Ctr, Inst Nephrol & Hypertens, IL-49100 Petach Tiqwa, Israel
 CLIN CHIM ACTA 1990, 190 (1-2) 115
 Glucose interferes with inulin determination by the resorcinol method: Overestimation of glomerular filtration rate in diabetic patients
- Marchessault RH, Taylor MG, Winter WT//McGill Univ, Dept Chem, 3420 Univ, Montreal, Quebec, Canada H3A 2A7
 CAN J CHEM 1990, 68 (7) 1192
¹³C CP/MAS NMR spectra of poly-beta-D(1-4) mannose:mannan
- Manohar B, Ramakrishna P, Ramteke RS//Cent Food Technol Res Inst, Mysore 570013, Karnataka, India
 J TEXTURE STUD 1990, 21 (2) 179
 Effect of pectin content on flow properties of mango pulp concentrates
- Silva MLAE//Inst Super Agron, Ctr Microbiol Ind Agr, P-1399 Lisbon, Portugal
 ACTA ALIMENT 1990, 19 (1) 19
 Characterization of a pectin from sunflower heads residues
- Snowden MA, Perkins HR//Glaxo Grp Res Ltd, Dept Biotechnol, Microbial Targets Grp, Greenford UB6 0HE, England
 EUR J BIOCHEM 1990, 191 (2) 373
 Peptidoglycan cross-linking in *Staphylococcus aureus* - An apparent random polymerisation process
- Bailey MJ//Valt Teknillinen Tutkimuskeskus, Biotech Lab, Tietotie 2, SF-02150 Espoo, Finland
 ENZYME MICROB TECHNOL 1990, 12 (8) 622
 Effect of temperature on polygalacturonase production by *Aspergillus niger*
- McKay AM//Dept Agr, Div Food & Agr Microbiol Res, Belfast, Northern Ireland
 LETT APPL MICROBIOL 1990, 11 (1) 41
 Degradation of polygalacturonic acid by *Saccharomyces cerevisiae*
- Ebina T, Tsukada K, Umezu K, Nose M, Tsuda K, Hatta H, Kim M, Yamamoto T//Tohoku Univ, Sch Med, Dept Bacteriol, Sendai, Miyagi 980, Japan
 MICROBIOL IMMUNOL 1990, 34 (7) 617
 Gastroenteritis in suckling mice caused by human rotavirus can be prevented with egg yolk immunoglobulin (IgY) and treated with a protein-bound polysaccharide preparation (PSK)
- Toritsu M, Hayashi Y, Ishimitsu T, Fujimura T, Iwasaki K, Katano M, Yamamoto H, Kimura Y, Takesue M, Kondo M, Nomoto K//Kyushu Univ, Sch Med, Dept Surg 1, 3-1-1 Maedashi, Higashiku, Fukuoka 812, Japan
 CANCER IMMUNOL IMMUNOTHER 1990, 31 (5) 261
 Significant prolongation of disease-free period gained by oral polysaccharide K (PSK) administration after curative surgical operation of colorectal cancer
- Hirao T, Sato T, Teramoto A*, Matsuo T, Suga H//Osaka Univ, Dept Macromolec Sci, Toyonaka, Osaka 560, Japan
 BIOPOLYMERS 1990, 29 (14) 1867
 Solvent effects on the cooperative order-disorder transition of aqueous solutions of schizophyllan, a triple-helical polysaccharide
- Ogawa Y, Goodman GB, Chaplin DJ, Grulkey W, Lam GKY//Kochi Med Sch, Dept Rafiol, Oko cho, Nankoku, Kochi 78351, Japan
 INT J RADIAT ONCOL BIOL PHYS 1990, 18 (6) 1415
 Combination therapy of pions and SPG (sonifilic, schizophyllan), a biological response modifier for mouse tumor systems

Mishaeva RN, Kuznetsova NP, Pisarev OA, Samsonov GV//Acad Sci USSR, Inst Macromolec Cpd, Leningrad, USSR

VYSOKOMOL SOEDIN SER A SSSR 1990, 32 (7) 1417

Features of ionization of carboxymethyl sephadex and their influence on haemoglobin binding

Sargent EV, Adolph J, Clemmons MK, Kirk GD, Pena BM, Fedoruk MJ//Merck & Co Inc, Dept Corp Safety & Ind Hyg, POB 2000, Rahway, NJ 07065, USA

J OCCUP MED 1990, 32 (7) 625

Evaluation of flu-like symptoms in workers handling xanthan gum powder

7 Polysaccharides - Other

Chaturvedi P, Sharma CB**/Univ Roorkee, Dept Biosci & Biotechnol, Roorkee 247667, Uttar Pradesh, India

CARBOHYD RES 1990, 203 (1) 91

Purification by high-performance liquid chromatography, and characterization, by high-field ¹H-n.m.r. spectroscopy, of two fucose-containing pentasaccharides of goat's milk

Gonda R, Tomoda M*, Shimizu N, Kanari M// *Kyoritsu Coll, Pharmaceut Sci, Shibakoen, Minato ku, Tokyo 105, Japan

CHEM PHARM BULL TOKYO 1990, 38 (7) 1966

An acidic polysaccharide having activity on the reticulendothelial system from the bark of *Eucommia ulmoides*

Helleur RJ, Jackman P//Mem Univ Newfoundland, Dept Chem, St Johns, Newfoundland, Canada A1B 3X7

CAN J CHEM 1990, 68 (7) 1038

Thermal fragmentation analysis of neutral polysaccharides and the presence of 1,6-anhydrooligosaccharides

Krylova NV, Besednova NN, Solovyeva TF, Loenko YN, Faustov VS, Konstantinova NA, Smolina TP, Elyakov GB//Acad Med Sci USSR, Epidemiol & Microbiol Res Inst, Vladivostok, USSR

ANTIBIOT KHMIOETHERAP 1990, 35 (4) 41

Antiinflammatory action of polysaccharide from ginseng cell cultures (Russian, English Abstract)

Lipkind GM, Nifantev NE, Shashkov AS, Ko-

chetkov NK//ND Zelinskii Organ Chem Inst, Moscow, USSR

CAN J CHEM 1990, 68 (7) 1238

NMR and conformational study of branched oligosaccharides containing 2,3-disubstituted residues of alpha-L-rhamnose

Lue C, Prince SJ, Fattom A, Schneerson R, Robbins JB, Mestecky J//Univ Alabama, Dept Microbiol, Birmingham, AL 35294, USA

INFEC IMMUNITY 1990, 58 (8) 2547

Antibody-secreting peripheral blood lymphocytes induced by immunization with a conjugate consisting of *Streptococcus pneumoniae* type 12F polysaccharide and diphtheria toxoid

Madar Z, Shomer I//Hebrew Univ Jerusalem, Fac Agr, Dept Biochem & Human Nutr, IL-76100 Rehovot, Israel

J AGR FOOD CHEM 1990, 38 (7) 1535

Polysaccharide composition of a gel fraction derived from fenugreek and its effect on starch digestion and bile acid absorption in rats

Nakajima H, Toyoda S, Toba T, Itoh T, Mukai T, Kitazawa H, Adachi S//Snow Brand Milk Prod Co Ltd, Tech Res Inst, 1-2 Minamidai 1 chome, Kawagoe, Saitama 350, Japan

J DAIRY SCI 1990, 73 (6) 1472

A novel phosphopolysaccharide from slime-forming *Lactococcus lactis* subspecies *cremoris* SBT 0495

Peters T, Brisson JR, Bundle DR//Univ Frankfurt Inst Biophys Chem, Theodor Stern Kai 7015, W-6000 Frankfurt 70, FRG

CAN J CHEM 1990, 68 (7) 979

Conformational analysis of key disaccharide components of *Brucella* A-antigen and M-antigen

Westerlund E, Andersson R, Aman P, Theander O//Swedish Univ Agr Sci, Dept Chem, Box 7015, S-75007 Uppsala, Sweden

J CEREAL SCI 1990, 12 (1) 33

Effects of baking on water-soluble non-starch polysaccharides in white bread fractions

Will F, Dietrich H**//Forsch Anstalt Geisenheim, Fachgebiet Weinanalyt & Getrankeforsch, Postfach 1154, W-6222 Geisenheim, FRG

Z LEBENSMITTEL-UNTERSUCH FORS 1990, 191 (2) 123

Analysis of the monomer composition of wine polysaccharides (German, English Abstract)

8 Lipopolysaccharides

Brandenburg K, Seydel U//Forschungsinstitut Borstel, Inst Exptl Biol & Med, Div Biophys, Parkallee 10, W-2061 Borstel, FRG

EUR J BIOCHEM 1990, 191 (1) 229

Investigation into the fluidity of lipopolysaccharide and free lipid A membrane systems by Fourier-transform infrared spectroscopy and differential scanning calorimetry

Granstrom G, Granstrom M, Anderson M, Lindquist U, Leontin K, Svenson SB, Wretling B//Danderyd Hosp, Dept Infect Dis, S-18288 Danderyd, Sweden

SERODIAG IMMUNOTHER INF DIS 1990, 4 (2) 151

Bordetella pertussis lipopolysaccharide as antigen in ELISA for serological diagnosis of whooping cough

Wilson M, Harvey W//Inst Dent Surg, Dept Clin Pathol & Immunol, 256 Grays Inn Rd, London WC1X 8LD, England

CURR MICROBIOL 1990, 21 (2) 91

A new assay for bacterial lipopolysaccharides

9 Starch

Arisz PW, Lomax JA, Boon JJ//FOM, Inst Atom & Molec Phys, Mass Spectrometry Macromolec Syst Unit, Kruislaan 407, 1098 SJ Amsterdam, The Netherlands

ANAL CHEM 1990, 62 (14) 1519

High-performance liquid chromatography/chemical ionization mass spectrometric analysis of pyrolysates of amylose and cellulose

Osungbaro TO//Polytech, Dept Chem, Food Sci & Technol Unit, Ibadan, Nigeria

J FERMENT BIOENG 1990, 70 (1) 22

Effect of fermentation period on amylose content and textural characteristics of ogi (a fermented maize porridge)

Takahashi F, Sakai Y//Utsunomiya Univ, Fac Engn, Dept Appl Chem, Utsunomiya, Tochigi 321, Japan

NIPPON KAGAKU KAISHI 1990, (7) 809

Facile method of amylose separation from corn starch by filtration through ceramic membrane (Japanese, English Abstract)

Hankeln K, Senker R, Beez M//Zent Kranken-

haus Bremen Nord, Anästhesie & Intern Med Abt, Hammersbecker Str 228, W-2820 Bremen 70, FRG

INFUSIONSTHERAPIE 1990, 17 (3) 135

Comparative investigation of the volume effectiveness of hydroxyethyl starch 10% versus human albumin 5% in randomized clinical studies (German, English Abstract)

Von Bormann B, Sticher J, Ratthey K, Idelberger R, Hempelmann G//St Johannes Hosp, Anästhesiol & Operat Intens Med Abt, Abtei 7-11, W-4100 Duisburg 11, FRG

INFUSIONSTHERAPIE 1990, 17 (3) 142

Volume replacement during acute normovolemic hemodilution - Human albumin 5% vs 6% hydroxyethylstarch 200 (0,55) (German, English Abstract)

Vsommoggy S, Fraunhofer J, Jelenesselnborn S, Stemberger A//Tech Univ Munich, Klinikum Rechts Isar, Gefasschirurg Abt, Ismaningerstr 22, W-8000 Munich 80, FRG

ANAESTHESIST 1990, 39 (7) 353

Coagulation changes during aortofemoral bifurcation bypass operations - Is plasma substitution possible with hydroxyethyl starch (HES) only

Buhrdel P, Bohme H-J, Didt L//Karl Marx Univ, Bereich Med, Kindermed Klin, Oststr 21-25, O-7050 Leipzig, FRG

Z KLIN MED-ZKM 1990, 45 (11) 979

Use of uncooked starch in dietary treatment of patients for type I glycogenosis (German, English Abstract)

Hansen LM, Hoseney RC, Faubion JM//Kansas State Univ Agr & Appl Sci, Dept Grain Sci & Ind, Manhattan, Ks 66506, USA

J TEXTURE STUD 1990, 21 (2) 213

Oscillatory probe rheometry as a tool for determining the rheological properties of starch-water systems

Heller J, Pangburn SH, Roskos KV//SRI Int, Controlled Release & Biomed Polymers Program, Menlo Pk, Ca 94025, USA

BIOMATERIALS 1990, 11 (5) 345

Development of enzymatically degradable protective coating for use in triggered drug delivery systems - Derivatized starch hydrogels

Levy MC, Andry MC//Univ Reims, Fac Pharm, Pharmacotech Lab, CNRS, URA 492, 51 Rue Cognacq Jay, F-51096 Reims, France

INT J PHARM 1990, 62 (1) 27

Microcapsules prepared through interfacial cross-linking of starch derivatives

Lindhauer MG, Defekete MAR//Agr Res Stn Buntehof, Bunteweg 8, W-3000 Hanover 71, FRG

PLANT SOIL 1990, 124 (2) 291

Starch synthesis in potato (*Solanum tuberosum*) tubers - Activity of selected enzymes in dependence of potassium content in storage tissue

South JB, Morrison WR//Allied Breweries Prod Ltd, 107 Stn St, Burton on Trent DE14 1BZ, England

J CEREAL SCI 1990, 12 (1) 43

Isolation and analysis of starch from single kernels of wheat and barley

Streeter MN, Wagner DG, Hibberd CA, Mitchell ED, Oltjen JW//Oklahoma State Univ, Dept Anim Sci, Stillwater, Ok 74078, USA

ANIM FEED SCI TECH 1990, 29 (3-4) 279

Effect of variety of sorghum grain on digestion and availability of dry matter and starch in vitro

10 Starch-degrading Enzymes

Anous BA, Blaschek HP**//Univ Illinois, Dept Food Sci, 580 Bevier Hall, Urbana, IL 61801, USA

APPL ENVIRON MICROBIOL 1990, 56 (8) 2559

Regulation and localization of amylolytic enzymes in *Clostridium acetobutylicum* ATCC 824

Bajpai P, Verma N, Bajpai PK//Thapar Corp, Ctr Res & Dev, Div Chem & Biochem Engrn, Patiala 147001, India

J MICROBIAL BIOTECHNOLOGY 1990, 5 (1) 39

Culture conditions for production of thermostable alpha amylase by *Bacillus* sp 25A and properties of the enzyme

Battershell VG, Henry RJ//Queensland Wheat Res Inst, POB 2282, Toowoomba, Qld 4350, Australia

J CEREAL SCI 1990, 12 (1) 73

High-performance liquid chromatography of alpha-amylases from germinating wheat and complexes with the alpha-amylase inhibitor from barley

Das G, Prabhu KA//Natl Sugar Inst, Dept Sugar Chem, Kanpur 208017, India

ENZYME MICROB TECHNOL 1990, 12 (8) 625

Immobilization of cane amylase and acid phosphatase on tricalcium phosphate (TCP) gel

Emneus J, Gorton L**//Univ Lund, Dept Analyt Chem, POB 124, S-22100 Lund, Sweden

ANAL CHIM ACTA 1990, 234 (1) 97

Effects on the hydrolysis of native starch and glycogen by a thermostable alpha-amylase after immobilization on solid supports

Hayashi M, Tsuru A, Mitsui T, Takahashi N*, Hanzawa H, Arata Y, Akazawa T//Nagoya City Univ, Coll Nursing, Nagoya, Aichi 467, Japan

EUR J BIOCHEM 1990, 191 (2) 287

Structure and biosynthesis of the xylose-containing carbohydrate moiety of rice alpha-amylase

Hayashida S, Teramoto Y, Inoue T, Mitsui S//Kyushu Univ, Dept Agr Chem, Fukuoka 812, Japan

APPL ENVIRON MICROBIOL 1990, 56 (8) 2584

Occurrence of an affinity site apart from the active site on the raw-starch-digesting but non-raw-starch-adsorbable *Bacillus subtilis* 65 alpha-amylase

Kim C-H, Kim D-S, Taniguchi H, Maruyama Y//Univ Tokyo, Dept Agr Chem, Biochem Lab, Bunkyo ku, 1-1-1 Yayoi, Tokyo 113, Japan

J CHROMATOGR 1990, 512 (JUL) 131

Purification of an amylase-pullulanase bifunctional enzyme by high-performance size-exclusion and hydrophobic-interaction chromatography

Okafor N, Ejiofor AO//Anambra State Univ Technol, Independence Layout, PMB 016609, Enugu, Nigeria

PROCESS BIOCHEM 1990, 25 (3) 82

Rapid detoxification of cassava mash fermenting for garri production following inoculation with a yeast simultaneously producing linamarase and amylase

Seltzer RD, Strumeyer DH//10 Landing Lane, APJ 9N, New Brunswick, NJ 08901, USA

J FOOD BIOCHEM 1990, 14 (3) 199

Purification and characterization of esculetamin, a proteinaceous alpha-amylase inhibitor from the taro root, *Colocasia esculenta*

Vihinen M, Mantsala P//Univ Turku, Dept Biochem, SF-20500 Turku 50, Finland
BIOTECHNOL APPL BIOCHEM 1990, 12 (4) 427

Characterization of a thermostable *Bacillus stearothermophilus* alpha-amylase

Yang GP, Zhang Q//Huazhong Agr Univ, Dept Agron, Wuhan, Peoples R China
EUPHYTICA 1990, 48 (3) 245

Polymorphisms of alpha-amylase activity in barley landraces and cultivars from China

Abe J, Nakajima K, Hizukuri S**//Kagoshima Univ, Fac Agr, Dept Agr Chem, Korimoto 1, Kagoshima 890, Japan

CARBOHYD RES 1990, 203 (1) 129

Alteration of the properties of *Aspergillus* sp K-27 glucoamylase on limited proteolysis with subtilisin

Ghosh A, Chatterjee B, Das A**//Univ Oklahoma, Hlth Sci Ctr, Dept Microbiol & Immunol, Oklahoma City, Ok 73190, USA

J GEN MICROBIOL 1990, 136 (JUL) PT 7, 1307

Induction and catabolite repression of high-affinity glucoamylase in *Aspergillus terreus* strain 4